

USEFUL RELATIONSHIPS

Liters in an Annular Tank = $\frac{(2r_o + \Delta r) \Delta rh}{318.3}$ where r_o = inner radius, cm

Δr = annulus thickness, cm

h = height, cm

Lattice Spacing - Hexagonal Lattices

simple rod, L.S. = $1.9046 r \sqrt{W/U+1}$, $(W/U \geq .10268)$

clad rod, L.S. = $1.9046 \sqrt{r_u^2 (W/U) + r_c^2}$, $(W/U \geq .10268 r_c^2 / r_u^2)$

clad tube, L.S. = $1.9046 \sqrt{(r_{2u}^2 - r_{1u}^2)(W/U) + (r_{2c}^2 - r_{1c}^2)}$, $\left(W/U \geq \frac{.10268 r_{2c}^2 + r_{1c}^2}{r_{2u}^2 - r_{1u}^2} \right)$
where W/U = water-to-uranium volume ratio

r_u = uranium radius

r_c = cladding radius

subscripts 1 and 2 denote inner and outer
radius, respectively

W/U - Hexagonal Lattices

simple rod, $W/U = [1.1027 (L.S.)^2 / d^2] - 1$, $(L.S. \geq d)$

clad rod, $W/U = [1.1027 (L.S.)^2 / d_u^2] - d_c^2 / d_u^2$, $(L.S. \geq d_c)$

clad tube, $W/U = [1.1027 (L.S.)^2 - (d_{2c}^2 - d_{1c}^2)] / (d_{2u}^2 - d_{1u}^2)$, $(L.S. \geq d_{2c})$

where d = diameter

Equivalent relationships - hexagon and circle of equal area

radius of circle = $.52504 \times (\text{lattice spacing})$

Neutron Velocity - Energy Relationships

$$v = 13.8 \times 10^5 \sqrt{E} \text{ cm per sec}$$

where E = energy in electron volts